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Appl. No. 10/007,186
Amtd. Dated: February 4, 2008
Office Action Dated: November 2, 2007

• • R E M A R K S / A R G U M E N T S • •

The Official Action of November 2, 2007 has been thoroughly studied. Accordingly, the following remarks are believed to be sufficient to place the application into condition for allowance.

Claims 1, 4 and 5 are pending in this application.

Claims 1, 4 and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ohkawa et al., *Influence of Temperature Prior to Seed Ripening and at Germination on Rosette Formation and Bolting of Eustoma Grandiflorum*, Scientia Horticulturae, Vol. 53, Issue 3, Feb. 1993, pp. 225-230 in view of Coolbear et al., *An Evaluation of the Potential of Low Temperature Pre-Sowing Treatments of Tomato Seeds as Means of Improving Germination Performance*, Ann. appl. Biol. (1987), 110, pp. 185-194 (1987) and U.S. Patent No. 5,294,593 to Khan.

For the reasons set forth below, it is submitted that all of the pending claims are allowable over the prior art of record.

Favorable reconsideration by the Examiner is earnestly solicited.

The Examiner has relied upon Ohkawa et al. as teaching:

...a method of preventing rosette formation of plant seed which tend to suffer from rosette formation during growth by low temperature seed treatments of hydrated seeds at 3-5C for 5 weeks (Ohkawa abstract; Eustoma grandiforum) and inherently prevents defective germination i.e. Ohkawa teaches leaving a plant seed to stand in a highly watery condition at a low temperature for a period of time from several days to rosette formation in a temperature from 0-15C.

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The Examiner concedes that: "Ohkawa is silent on teaching that the plant seed is undergoes drying after immersion in the water and that the immersion and drying are conducted in a dark place."

The Examiner has relied upon Coolbear et al. as teaching:

...the seed treatment of allowing seeds to imbibe water at 10C in darkness and then drying the seeds (Coolbear Methods, first paragraph) and inherently relative humidity of 100% (Coolbear teaches the seeds are in a cover dish and are continuously kept moist thus the humidity is 100%, Methods line 2-4).

The Examiner takes the position that:

It would have been obvious to one of ordinary skill in the art to modify the teachings of Ohkawa with the teaching of Coolbear at the time of the invention for the known advantage of preventing defective germination and for storage since it is general knowledge in the art that light and darkness have effects on germinator.

The Examiner further takes the position that:

It would have been obvious to one of ordinary skill in the art that if a particular seed is a light germinator it is desirable to treat and store the seed in the dark to prevent germination.

The Examiner has relied upon Khan as teaching that:

...it is old and notoriously well-known to dry hydrated seeds in the dark to prevent a break in dormancy (Khan Col. 3 line 40-49).

The Examiner takes the position that:

It would have been obvious to one of ordinary skill in the art to modify the teachings of Ohkawa with the teachings of Khan at the time of the invention for preventing loss of dormancy for storing seeds for several months as taught by Khan (Khan Col. 3 line 50-52).

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It is believed that the Examiner has misinterpreted the teachings of Ohkawa et al.

The Abstract indicates that Ohkawa et al. is concerned with decreasing rosette formation while preventing or suppressing seedling bolting.

Thus, Ohkawa et al. is not at all directed to any improvement in the germination of the seeds.

Note specifically the Abstract reads, in part:

Rosette formation and subsequent bolting of *Eustoma grandiflorum* are influenced by temperature conditions prior to seed ripening and after germination has commenced. Rosette formation was decreased if parent plants were matured at 23/18°C (day/night) temperature was increased at 33/28°C. Further low temperature seed treatment of hydrated seed at 3°C or 10°C for 5 weeks decreased rosette formation and enhanced subsequent seedling bolting.

As can be seen, Ohkawa et al. is primarily directed at subjecting plants (not seeds) to low temperature treatments after germination and prior to seed ripening.

Experiment 1 corresponds to the cold treatment of plants referred to in the Abstract of Ohkawa et al. As set forth in Experiment 1, plants were transferred to natural-light phytotrons set at 33/28, 28/23 or 23/18°C day/night temperature. Seeds were then harvested from the plants and tested.

The "further" low temperature treatment of the hydrated seeds mentioned in the Abstract of Ohkawa et al. is exemplified in Experiment 2. In Experiment 2:

Seeds of 'Fukushihai' and 'Miyakomomo' were hydrated at 28/23°C for up to 3 days and then stored at 3 or 10°C for 5 weeks. These treatments were given under continuous irradiance ($15.0\text{-}25.3 \mu\text{mol m}^{-2} \text{s}^{-1}$).

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As can be seen, Ohkawa et al. teaches hydrating the seeds at a higher temperature (28/23°C) for "up to 3 days" (Note: 3 days is an express upper time limit).

After this hydration step, the seeds are stored at 3 or 10°C for 5 weeks during which storage the seeds are irradiated so that "Upon completion of the 3 or 10°C temperature treatment, *seedlings* were transferred into a 33/28 or 28/23°C (day/night) phytotron."

Ohkawa et al. clearly teaches – and requires – the continued irradiance to produce seedlings which are subsequently sown and tested.

Ohkawa et al. does not teach specifically teach "leaving the plant seed to stand in a highly watery condition at a low temperature.... for a period of time of from several days to several months."

Rather the seed were expressly hydrated for only up to 3 days at 28/23°C.

After the hydration, Ohkawa et al. does not teach "leaving the plant seed to stand in a highly watery condition at a low temperature *in a dark place* for a period of time of from several days to several months.

Rather, Ohkawa et al. teaches irradiating the seeds and developing seedlings.

It would go against the express teachings of Ohkawa et al. to store the hydrated seeds in the dark.

Further, it is noted that there is no suggestion or motivation to modify Ohkawa et al. to store the hydrated seeds in the dark.

Further, there is no suggestion or motivation to dry the hydrated seeds of Ohkawa et al.

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Coolbear et al. does not include any discussion as to the effect of the low-temperature pre-sowing treatment on rosette formation other than the statement that:

No evidence was found for improved seeding growth rates per se as a result of pretreatment: in fact, initial axis growth may be temporarily reduced, probably as a consequence of depletion of reserves during the treatment period.

If anything, Coolbear et al. teaches that initial axis growth after germination may be at least inhibited, if not adversely effected.

In any event, Coolbear et al. does not teach that the low-temperature pre-sowing treatment prevents defective rosette formation.

Further, Coolbear et al. does not teach leaving the seeds in a highly watery condition at a low temperature in a dark place for a period of time of from several days to several months to inhibit defective germination and rosette formation of the plant seed as required by applicant's claims.

Moreover, Coolbear et al. does not teach the time-critical condition of drying the seed in a dark place before the seed becomes active, the dark place being sufficient to prevent the plant seed from germinating.

If anything Coolbear et al. teaches drying the seeds in open Petri dishes at room temperature.

From such a procedure it certainly cannot be inferred that Coolbear et al. provides any insight into (i.e. renders obvious) applicant's drying process that prevents defective germination and rosette formation.

Khan is directed at a method of "inducing releasable dormancy in non-dormant plant seeds" which involves soaking the seeds in a "gibberellin synthesis inhibitor solution."

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As explained in column 2, lines 22-39 the gibberellin biosynthesis pathway includes seventeen steps. By introducing a gibberellin synthesis inhibitor into the seeds (by soaking the seeds in a gibberellin synthesis inhibitor solution), Khan induces dormancy into the seeds.

The Examiner had previously relied upon Khan as teaching:

...that it is old and notoriously well-known to dry hydrated seeds in the dark to prevent germination.

Presently the Examiner has relied upon Khan as teaching:

...it is old and notoriously well-known to dry hydrated seeds in the dark to prevent a break in dormancy (Khan Co. 3 line 40-49).

The drying discussed at column 3, lines 40-52 of Khan in a drying step (c), in which the hydrated seeds are dried in a dark place in order to prevent the inactive condition (i.e. dormancy) of the seed, wherein the drying step (c) is carried out after the immersion step (a) and after the washing step (b).

Accordingly, the drying step (c) of Khan does not correspond to the drying step of the present invention in which the drying takes place immediately after leaving the plant seed to stand in the highly watery condition at the low temperature in a dark place.

Further, as the Examiner is no doubt aware, Khan fails to teach applicant's steps (a) and (b).

Overall it is noted that none of the prior art references relied upon and combined by the Examiner teach or are concerned with rosette formation or preventing rosette formation (despite the Examiner's contention that Harbaugh's reference to bolting data inferred rosette formation effects).

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Accordingly, there is no basis for relying upon prior art to reject applicant's claimed invention or any basis for establishing that the prior art suggests or renders obvious applicant's claimed invention.

In the *Response to Arguments* section of the Office Action the Examiner argues that:

Ohkawa teaches allowing the seeds to sit in a hydrated condition at a low temperature for 5 weeks, 5 weeks is several days and more than one month (Ohkawa abstract).

It is only the Examiner's conjecture that the seeds that were hydrated for up to 3 days in Ohkawa et al. are thereafter allowed to sit in "highly watery condition" (per applicant's claims) during the storage taught by Ohkawa et al. The teachings of Ohkawa et al. do not support the Examiner's position.

The Examiner argues that Coolbear et al. teaches seed pre-treatment in a dark place at page 186 in reference to "allowing seeds to imbibe distilled water at a constant 10°C in darkness."

It is noted that this treatment is taught by Coolbear et al. as lasting 0.5 to 120 hours and afterwards the seeds were tried in open Petri dishes.

The time period of 0.5-120 hours is not at all comparable to the 5 weeks of storage taught by Ohkawa et al. during which seedlings are produced.

Moreover, the pregerminants were expressly removed and discarded by Coolbear et al. If a similar procedure were applied to and followed in Ohkawa et al. all the seedlings would be discarded.

This means that the experimentation conducted by Coolbear et al. which involves drying imbibed seeds and throwing out pregerminants following by drying the seeds and testing the resulting

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seed has no relationship to Ohkawa et al. who conduct experimentation and tests on the seedlings obtained after hydration and storing under irradiation.

Thus, there is no basis for comparing and/or combining the teachings and conclusions reach by Ohkawa et al. and Coolbear et al.

Based upon the above distinctions between the prior art relied upon by the Examiner and the present invention, and the overall teachings of prior art, properly considered as a whole, it is respectfully submitted that the Examiner cannot rely upon the prior art as required under 35 U.S.C. §103 to establish a *prima facie* case of obviousness of applicant's claimed invention.

It is, therefore, submitted that any reliance upon prior art would be improper inasmuch as the prior art does not remotely anticipate, teach, suggest or render obvious the present invention.

It is submitted that the claims, as now amended, and the discussion contained herein clearly show that the claimed invention is novel and neither anticipated nor obvious over the teachings of the prior art and the outstanding rejections of the claims should hence be withdrawn.

Therefore, reconsideration and withdrawal of the outstanding rejection of the claims and an early allowance of the claims is believed to be in order.

It is believed that the above represents a complete response to the Official Action and reconsideration is requested.

If upon consideration of the above, the Examiner should feel that there remain outstanding issues in the present application that could be resolved, the Examiner is invited to contact applicant's patent counsel at the telephone number given below to discuss such issues.

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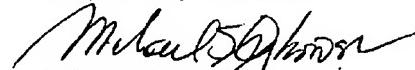
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To the extent necessary, a petition for an extension of time under 37 CFR §1.136 is hereby made. Please charge the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 12-2136 and please credit any excess fees to such deposit account.

Respectfully submitted,



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